



Original article

A survey of food safety information and foodborne infections post solid organ transplant



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SUMMARY

Background & aims: Over 4000 solid organ transplants are carried out annually in the United Kingdom and Republic of Ireland. These patients are commenced on essential immunosuppression therapy, which increases the likelihood of acquiring an infection from foods. Patients are given information to reduce this risk, however not all centres give this advice and the advice given is not standardised. This paper reports on the findings from a survey of dietitians that set out to describe current practice in relation to food safety information given post solid organ transplant.

Methods: An internet-based questionnaire was sent to transplant dietitians in the United Kingdom and Republic of Ireland enquiring about current practice and incidence of foodborne infections after a solid organ transplant.

Results: Thirty-eight questionnaires were returned containing information about heart, lung, kidney, liver, pancreas and small bowel transplant recipients. Respondents from all but one transplant centre reported they gave food safety advice. The recommended duration and content of the advice varied. The largest variable was regarding specific food avoidance. Foodborne infections were reported in patients following kidney, kidney-pancreas, liver and lung transplants.

Conclusions: There is variation in the food safety information given to patients after a solid organ transplant. Post transplant foodborne infection remains a serious complication of a solid organ transplant and its concurrent immunosuppression. Further development of knowledge in this area, would benefit patients who may already have compromised nutritional intake and health. Nationally standardised post transplant food safety information is recommended.

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1. Introduction

Over 4000 solid organ transplants (SOTs) are carried out per year in the United Kingdom (UK) and Republic of Ireland (ROI), across 31 centres [1]. These consist of heart, lung, kidney, liver, pancreas and small bowel transplants. Unless the transplant donor and recipient are genetically identical, the recipient will be commenced on immunosuppression therapy for the life of the graft to prevent rejection of the new organ(s) [2]. Immunosuppression makes patients more vulnerable to infections by reducing cellular immune function [2]. Potentially these infections could come from bacteria, viruses or parasites present in food, resulting in a foodborne infection (FBI) [3]. Statistics are not kept on post transplant

FBI (PTFBI) rates in the UK or ROI (personal communication, Public Health England, 2013, and National Health Service Blood and Transplant [NHSBT], 2013). However it is estimated that people with a compromised immune system are 15–20% more susceptible to FBIs than the general population [4]. Due to the increased risk of FBIs in this group, some transplant centres provide patients with post transplant food safety information (PTFSI). However PTFSI is not universally given at all transplant centres. There is now standardised food safety information available for transplant recipients in the United States [5] but there are no European or national guidelines or patient information sheets in the UK or ROI.

The community of dietitians who care for patients following SOTs in the UK and ROI have discussed whether it is necessary for patients to receive PTFSI. In this vulnerable group it is often felt safer to take a cautious approach. However there is concern over potentially needless dietary restrictions for patients with the challenges of wound healing, medication side-effects, potential

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rejection, systemic recovery from surgery and the original indication for transplant.

It would be unethical to undertake a trial allocating some patients PTFSI while withholding it from others. In order to gain an overview of current practice a survey has been carried out of dietitians at all transplant centres in the UK and ROI and some follow-up centres. The survey asked respondents what PTFSI they give and what incidences of PTFBIs have occurred in their centre in patients following a SOT. The primary aim was to define current practice with regard to the PTFSI being given in the UK and ROI. A secondary aim was to discover if cases of PTFBI occur in patients following a SOT in the UK and ROI.

2. Methodology

An online survey was designed by the first author using Bristol Online Survey (<http://www.survey.bris.ac.uk>) (see [Supplementary information](#)) and reviewed by transplant dietitians before being disseminated. It consisted of three questions regarding the type of transplant patients the respondent works with, eight questions regarding the advice given and one question regarding details of any cases of a PTFBI in a patient following a SOT at that centre in the past ten years. The majority of these questions were closed questions with tick boxes for answers and there were four open questions. Respondents were asked, if they were happy to do so, to identify their centre and send a copy of the information sheet they give to patients. The survey took approximately ten minutes to complete. All data are as reported by respondents, no external validation was sought. The Employing Trust of the surveyor deemed the work a service evaluation, therefore not requiring ethics approval.

The web address of the online questionnaire was emailed with a cover letter to the Renal Nutrition Group of the British Dietetic Association (BDA), the UK Heart Health and Thoracic Dietitian's Group of the BDA and individually to the Liver Transplant and Small Bowel Transplant Dietitians. Both the Renal Nutrition Group and Heart Health and Thoracic Group of the BDA contain transplant dietitians as well as many non-transplant dietitians.

After three months, transplant centres were telephoned to find the email address of the specific dietitian working with post transplant patients, they were then emailed directly with the questionnaire and cover letter. Questionnaires were sent to dietitians at all 31 transplant centres in the UK and ROI as well as dietitians working at follow up centres via specialist group distribution lists. It was requested that the questionnaire was filled out once for each type of organ transplanted at each centre and separately for adult and paediatric patients. Results were then collated using Microsoft Excel (2003) and analysed using descriptive statistics.

3. Results

Thirty-eight questionnaires were returned from dietitians at 25 different named centres, four respondents did not identify their centre. Responding dietitians worked at centres transplanting hearts ($n = 4$), kidneys ($n = 14$), kidney-pancreas' ($n = 2$), livers ($n = 7$), lungs ($n = 3$) and small bowels ($n = 2$). A further 6 respondents worked at follow up centres caring for patients transplanted elsewhere. No duplicate responses were identified. The participant response rate is unavailable due to the open method of recruitment but the named centres indicate that responses were received from dietitians at at least 62% of the 31 transplant centres in the UK and ROI.

With the exception of one paediatric liver transplant centre and four of the six kidney transplant follow up centres, respondents from all other centres reported giving PTFSI. Further details can be seen in

Table 1. In the majority of centres (27), dietitians gave out the PTFSI, but in eleven and two respectively, this information was also given out by transplant nurses or transplant coordinators and doctors.

Most respondents reported giving the same advice to paediatric patients and adult patients, except for at one liver transplant centre which gave PTFSI to adult patients only.

3.1. Where post transplant food safety information is given

Thirty-two of the 33 respondents who report PTFSI is given at their centre, report recommending patients avoid specific foods. All of the 33 respondents reported giving advice on food storage, preparation or cooking. They recommend that this advice is followed for the durations shown in [Table 2](#).

The reasons given for recommending PTFSI to their patients were given largely as, 'to prevent foodborne infections while immunosuppressed', other answers given were:

- 'on the advice of our microbiologist',
- 'to make patients aware of the risks',
- 'recommendations from renal nutrition group of BDA',
- 'not enough evidence to do otherwise'

Most dietitians reported that their centre had not changed the PTFSI given to their patients recently. The ten that had changed their advice had decreased the time they recommended patients follow this advice or had included avoiding probiotics in the advice given or had increased the list of foods they recommend patients avoid following publication of guidelines for neutropenic patients within their hospital.

Sixteen responses included a copy of the written PTFSI they give to patients. These documents were compared with regard to the foods they recommended patients avoid. [Fig. 1](#) indicates the number of respondents reporting they advise avoidance of certain foods at their centre.

Survey respondents reported that of this sample all patients receiving a small bowel transplant were advised to avoid probiotics, as were those at a third of kidney and lung transplant centres, half of the heart and kidney-pancreas transplant centres and five of the seven liver transplant centres.

3.2. Foodborne infections

The respondents from heart and small bowel transplant centres reported no PTFBIs in their patients in the past ten years. However respondents from 1 of 2 kidney-pancreas transplant centres, 1 of 3 lung transplant centres, 3 of 8 liver transplant centres and 6 of 19 kidney transplant centres did. The respondents reporting that they had experienced a PTFBI in that organ type at their centre gave the following information regarding these infections ([Table 3](#)).

3.3. Comparison of centres where respondents reported a foodborne infection and no foodborne infection

The responses from those reporting experience of PTFBI at their centre have been compared with those from respondents who

Table 1
The number of centres who give PTFSI to patients after each type of organ transplant.

Organ transplant group	Centers giving PTFSI
Heart	4/4
Kidney	15/19
Kidney-pancreas	2/2
Liver	7/8
Lung	3/3
Small bowel	2/2

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